

IV. *Some Particulars of the Natural History of Fishes found in Cornwall.* By Mr. Jonathan Couch. Communicated by Sir James Edward Smith, M.D. F.R.S. Pres. L.S.

Read February 19, 1822.

SEVERAL years have passed since I began to collect information respecting the Fishes which have been met with in the Cornish waters; and my materials, drawn principally from personal investigation, became so considerable, that I announced my intention of speedily submitting them to the public attention. But circumstances, over which I have little contról, have hitherto frustrated the design; and not seeing a probability of its being soon put in execution, I desire to lay the following sketch before the Linnean Society. I omit an account of those habits and instincts of the subjects of this communication, which are generally known, that I may not trespass unnecessarily on the attention of the Society.

APODAL FISHES.

MURÆNA.

Eel. *M. Anguilla*.—The Eel may be considered as a migratory fish. The young ones as soon as they are produced (which in the sphere of my observation is always within the reach of the tide) begin to advance up the river; and to accomplish this object, overcome difficulties of an extraordinary

dinary kind. I have seen them, at the fall of a river, dive below the moss, that hung from above into the water, and worm themselves upward through the fibres by the side of the stream, resting at intervals as if to recover strength; and at last, when at the top, exert their utmost activity to stem the rapid current and reach a place of safety. In getting up the little cataract that pours over a sloping rock, they prefer those places which are only moistened by the droppings from above; but those which quit the moisture altogether, as I have seen some do, are obliged to alter their course, and proceed to places more easy for them to travel in. The motive for this migration, which is general among young Eels, I have not been able to discover. Some among them I have observed to be so diaphanous that the vertebræ may be counted; and, taking advantage of an opportunity of this kind, I ascertained that when in a state of activity, and not alarmed, the pulsations of the heart were forty in a minute.

Conger. *M. Conger*.—This fish frequents rocky ground, and is frequently found concealed in holes of rocks. When hooked on a long line moored in the sea, it will sometimes escape by twisting its body round until the hook is wrenched from the jaws or the cord broken. It uses the same expedient when it seizes its enemy, and thus sometimes inflicts a very dangerous wound. It will draw itself overboard by the help of its tail; but is disabled by a blow on the vent.

XIPHIAS.

Swordfish. *X. Gladius*.—I have not seen this fish taken, but it is often met with by fishermen.

AMMODYTES.

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Launce. *A. Tobianus*.—This fish is gregarious ; it keeps in deep water in winter, but in summer and autumn frequents sandy bays, where it is preyed on by many kinds of fish. The fleshy process that points the lower jaw is excellently adapted to enable it to bury itself in the sand, which is the method it takes to escape its pursuers. It is common to see in the little companies that are moving along near the surface, one that is much larger than the others, which seems to act as captain, and leads the advance.

JUGULAR FISHES.

CALLIONYMUS.

Dragonfish. *C. Lyra*.—This fish is extremely rare, and has never fallen within the reach of my observation.

Skulpin. *C. Dracunculus*.—I have given the common English name of this fish, because I in general prefer it to that which is arbitrarily bestowed by naturalists. It keeps at the bottom in stony places, and is sometimes found to take a bait. The skin is always besmeared with a large quantity of tenacious mucus.

TRACHINUS.

Greater Weever. *T. Draco*.—I have known such effects to arise from the puncture of the spine on the gill-covers of this fish, as can only be accounted for on the supposition of its conveying some venomous quality. In three men who were wounded by one fish, the pain and tension proceeded from the hand to the shoulder in a few minutes.

GADUS.

GADUS.

§ Cirri at the Mouth.

Haddock. *G. Aglefinus*.—This fish appears to be continually changing its quarters. It comes into season at the beginning of winter, at which time it is taken in more considerable numbers than before.

Cod. *G. Morhua*.—It is taken through the year, but is more plentiful in winter than at other times, being then also in season. This fish, with probably others of this genus, possesses filaments between the teeth and lips, that seem designed to enable it to discover and select its prey. And how well they are able to fulfill their object, appears from the instance of a Codfish, which was taken on a line near this place (Polperro) a few years since. It was distinguished by the striking peculiarity of wanting both eyes. The sockets contained no eye-ball; and I am convinced that they never had existed, the common opaque skin covering the sockets in a curiously reticulated manner. Yet the fish was large, and in good condition.

Bib. *G. Luscus*.—It frequents rocky places, and, though common, is rarely taken in great numbers. This fish has a singular faculty of distending the transparent covering of the eyes when taken; the fins also are often similarly blown up.

Poor. *G. minutus*.—The habits of this fish resemble those of the Bib. It comes into season in the spring, at which time it abounds. The two last named species are equal in delicacy as food to any of the genus.

Ling. *G. Molva*.—This fish is common at all seasons; but in January and February it approaches the rocky ground near the land in order to deposit its spawn; at which time it is taken in great numbers. The Ling is one of the most prolific of a prolific genus; I have known a roe weighing seven pounds

pounds taken from a fish whose weight was about forty pounds.

Rock-Ling. *G. Mustela*.—This fish makes a near approach to the genus *Blennius*, which in habits it very much resembles. It has no air-bladder; and not being endued with strength of fin, for the absence of which the air-bladder is a compensation, it continues at the bottom, near the shore, among the rocks and weeds. The variety of this fish which possesses five barbs has been supposed to be a distinct species; but from attentive examination I am convinced that this is a mistake: both varieties are common, frequenting the same places, and having no other marks of difference. Both of them are subject to great varieties of colour, from a light yellow with brown spots, to an uniform reddish-brown. Nor is the number of cirri an objection to this supposition, as I have seen the common Ling with two cirri at the throat.

All the species of the genus *Gadus* that are furnished with barbs are found to keep near the bottom, from whence they principally take their food; the sea egg (*Echinus*) and various species of crabs are found in their stomach; and the Ling is even found to devour the picked dog, *Squalus spinax*. Of the use of the ciliated membrane on the back of the Rock-Ling I am able to form no opinion; but I have remarked it to be always in motion in the water, even when the other fins are at rest.

§§ No Barbs.

Whiting. *G. Merlangus*.—It is found through the year, is gregarious, and frequents sandy ground.

Whiting Pollack. *G. Pollachius*.—This is a solitary fish, is common at all times, and at all times is equally good.

Rauning Pollack or Coalfish. *G. Carbonarius*.—This fish has

acquired its common trivial name from its extreme rapacity, *rauning* being the Cornish pronunciation of ravening. It is sometimes found in great numbers, and is in season from the end of summer to the spring; but when it has deposited its spawn it becomes emaciated in an extraordinary degree. It is coarse food. In a fine summer evening large schools of the young of this fish are seen in the coves and sandy bays sporting in all the luxuriancy of youth; whilst Cuttlefishes are employed in making that havock among them, which when fully grown they make among other fish.

Hake. *G. Merlucius*.—This fish seems to wander much through the ocean. When Pilchards make their appearance, it does not fail to accompany them, and is then taken in considerable numbers. In spring it drops its spawn in sandy ground, and at this season does not commonly take a bait. It is not much esteemed as food.

Those of this genus which have no barbs at the mouth swim at a higher elevation than the others, and take their food principally as it swims.

BLENNIUS.

Shanny. *B. Pholis*.—This fish is incapable of sporting with freedom in its native element; on the contrary, being of a heavy make, and destitute of an air-bladder, as are most of the genus, it takes up its residence on some rock, from which it seldom wanders to any considerable distance; and, as if afraid to depend too much on its powers of swimming, which, though vigorous, are soon exhausted, it passes from one resting-place to another by the shortest way; and is commonly supposed to be in danger of perishing if thrown into deep water. When the tide retires, the rock which
afforded

afforded it a resting-place provides for it also a shelter. Some are left in pools; but many take refuge in holes, where they remain until the returning tide restores them to liberty. It devours shell-fish, and with its strong incisor-teeth will even separate the testaceous covering of the embryo shell-fish from its attachment to the rock and devour it. I have observed of this fish, that when in its element it is capable of directing its eyes in different directions, one looking forward and the other backward at the same time.

Crested Blenny. *B. Galerita*.—This resembles the Shanny in most of its habits; but is not so common.

Butterfish. *B. Gunnellus*.—Frequents oozy ground.

Greater forked Beard. *B. Phycis*.—This fish keeps in deep water, and is not common. It has the habits of a *Gadus*, and in taste much resembles the common Ling. The Cornish fishermen call it the Hake's Dame. I would suggest that this fish might with propriety be placed in a genus, which might be denominated *Phycis*; and be distinguished by the barb at the throat. The ventral fins bear a greater resemblance to the fingers of the genus *Trigla* than to the ordinary fins of fishes. The dorsal and anal fins have the vestige of a junction to the caudal fin; a few spines are placed before the anal fin.

Lesser forked Hake.—The insertion of this species is on the authority of Mr. Jago in Ray's *Synopsis*; as I have never had the good fortune to meet with a specimen*. The

* Since this paper was read, I have met with the *Lesser Forked-Beard* of Jago Length ten inches; head wide and flat; eyes forward and prominent; under-jaw shortest; teeth in the jaws and palate, sharp and incurved, and some in the throat; small barb at the under-jaw; body compressed, smooth; first dorsal fin triangular and extremely small; second dorsal fin and the anal fin long, ending in a point; tail round; ventral fins have several rays, of which the two outmost are much elongated, the longest measuring two inches; the fins all covered with the common skin;

The three first species of this genus are destitute of a swimming-bladder: in the Hake's Dame this organ is bordered with a fringe of curious tubercles.

THORACIC FISHES.

CEPOLA.

Red Snakefish. *C. rubescens*.—Two specimens of this fish have come into my possession; one of them, about five or six inches in length, was taken with a line; the other, from which my description was taken, was thrown on shore in a storm. It measured fifteen inches in length, an inch and a quarter in depth at the deepest part, including the dorsal and anal fins, and was very thin; but the smaller specimen above alluded to was nearly round. It tapered both in depth and thickness toward the tail. The angle of the mouth was much depressed, which caused the under jaw to appear the longest; both were armed with long and sharp teeth. The eyes were large, and the head short before them. The dorsal fin was twelve inches in length, and had seventy rays; the anal fin was eleven inches long, and had sixty rays; the tail distinct, spear-shaped, of twelve rays, the middle rays being two inches long and ending in a point, and the rays at the sides not exceeding a fourth of that length. The ventral fins were pointed, and fastened to the body for about half their length by a fine membrane. Beside the lateral line there was a row of small bony prominences near the dorsal fin. The colour was a diluted red. From the inspection of several specimens, I am inclined to think that this ought to be ranked as a Jugular Fish.

a furrow passes above the eyes to the back; stomach firm, with longitudinal folds; no appendix to the intestines; air-bladder large, and of unusual form. In the intestines were the remains of an *Echinus*. This fish has all the marks of a *Gadus*, to which genus it appears to me properly to belong.—J. C.

Gymnetrus.

Gymnetrus.

Ceil Conin. *G. Hawkenii*, Bloch.—This fish was drawn on shore in a net at Newlin in this county, in February 1791. The extremity of the tail was wanting; the length of what remained was eight feet and a half, the depth ten inches and a half, thickness two inches and three quarters, weight forty pounds. A coloured drawing of this fish is in the possession of William Rashleigh, Esq. F.L.S. of Menabilly.

Gobius.

Spotted Goby. *G. Aphyia*.—In the summer months this fish is found in numbers among the rocks.

Rockfish. *G. niger*.—This is much more rare than the former.

Cottus.

Bullhead. *C. Gobio*.—There are many brooks in this county in which this fish is not known. This species and *C. Scorpius* want the air-bladder.

Zeus.

Doree. *Z. Faber*.—This fish visits our coasts when Pilchards make their appearance, and continues until spring. Although it appears to move slowly through the water, it contrives to satisfy its voracity by the capture of fishes which possess considerable activity; it will even overtake and devour a Cuttle as long as itself.

Pleuronectes.

§ With Eyes on the right side.

Holibut. *P. Hippoglossus*.—This is the largest of the genus; but I have not seen one exceeding a hundred and twenty-four pounds in weight.

With

§§ With Eyes on the left side.

Kite. *P. rhomboides*.—This species seems to unite Flat-fishes with those which swim on their edge, the under side often participating in the colour of the upper; I have seen it cover a third part of the under surface.

Whiff. *P. punctatus*.—The dorsal and anal fins pass under the tail, and are very nearly joined together on the white side. This species rarely, if ever, takes a bait. It keeps in rocky ground.

Pearl. *P. Rhombus*.—This seems to be scarce, at least within my observation.

Carter, or Lanternfish. *P. megastoma?* Don.—This is the species which Jago in Ray's *Synopsis* has figured under the name of Whiff; but it is different from *P. punctatus*. Teeth in both jaws and palate; gill-membrane with seven rays; body lengthened and very thin; ventral fins broad; tail somewhat round; lateral line very crooked at its commencement; colour of the upper-side a reddish-brown, with spots of a lighter colour round the sides; length about twelve inches. It is common, and as food is the worst of the genus. It is also called Marysole.

CHÆTODON.

Only one specimen of this genus has come within my notice. This was taken at Looe, swimming alive on the surface of the water, in August 1821; and as I have not been able to refer it to any described species, I subjoin a description.

It was about seventeen inches long, and, exclusive of the dorsal fin, five inches and a half deep; the snout was blunt, sloping suddenly above the eyes; the angle of the mouth depressed; the teeth numerous, sharp, incurved, four in front of the under jaw very long; the body deep, thin; two dorsal

sal fins, the first having flexible rays, the second long and narrow; tail very deeply lunated; the pectorals long; the ventrals double or having a wing, by which means it seemed to have four ventral fins; the anal fleshy, and somewhat expanded at the origin, obscure in its progress towards the tail; no lateral line; a broad band from eye to eye; the colour blue, deeper on the back than on the belly; covered with large scales, as well the body as the fins, so that the dorsals and anals seem like an extension of the body. I was unable to count the rays of the dorsal fins.

SPARUS.

Bream. *S. Smaris*.—This is taken at all seasons, but chiefly abounds in summer and autumn; the young ones, called Chads, which have not the lateral spot until the second year of their growth, are in vast numbers in summer.

Becker. *S. Pagrus*.—This species is seen only in summer and autumn; the young ones never approach the shores like the Chads.

Oldwife. *S. Vetula*, C.—Although the English name here given to a species of *Sparus* is applied by naturalists to one of a different genus, yet I am obliged to use it to designate a fish presently to be described, as it is the only one which our fishermen make use of. The body is deep, compressed, and has a considerable resemblance to the *S. Pagrus*; the lips are fleshy, and the jaws furnished with a pavement of teeth, of which those in front are the longest; the gill-membrane has five rays; the gill-covers and body are covered with large scales. The ten first rays of the dorsal fin are spinous; the anal fin also has four spinous rays, after which it becomes more expanded; the tail is concave. This fish has a membranous septum across the palate, as in the Wrasse genus.

When

When in high season, the colour behind the head is a fine green, towards the tail it is a reddish-orange; the belly has a lighter tinge of the same colour. When out of season the whole is a dusky-lead colour. It weighs about three pounds.

These three species feed principally on sea-weeds, for the digestion of which they are furnished with long and capacious intestines; their teeth also are well adapted for bruising this food previous to its being swallowed.

LABRUS.

Common Wrasse. *L. Tinca*.—This fish keeps in rocky ground, and feeds on crustaceous animals. The old Wrasse commonly assumes the dominion of his district, and keeps the younger ones at a distance; so that their numbers most abound where they are most fished for. They are not much esteemed as food.

Bimaculated Wrasse. *L. bimaculatus*.—Although this species is mentioned as a Cornish fish, I am not acquainted with it; but perhaps this will not be deemed a sufficient reason for doubting its existence as a distinct species.

Cook. *L. Coquus*.—The habits of this species and of *L. comber* are similar. In the summer they are found near the shore; in winter they pass into deeper water; but are taken by fishermen through the year, and are principally employed as bait for other fish.

Besides these and *L. cornubiensis*, I have noticed another species, which is by fishermen confounded with the *L. Tinca*, and which I am unable to refer to any Linnæan species. It differs from the common Wrasse in the following particulars: The body is longer in proportion to its depth, and somewhat thicker; the ventral fins, which in the *L. Tinca* reach just to the anus, in this reach but two-thirds of that distance; a light-coloured

coloured line runs from the eye to the tail; the anterior bone of the gill-cover has a smooth margin, but in the *L. Tinca* it is finely serrated; the lateral line also forms an acute angle at its curve, pointing downward in the *Tinca*; in this species it has a gentle curvature; it has twenty spinous rays in the dorsal fin. The colour of the back is a dark brown, lighter at the sides, saffron-coloured on the belly. It is common*.

SCIÆNA.

Basse. *S. Labrax*.—This fish is particularly fond of *Onisci*, in pursuit of which it ventures among the rocks in the midst of a tempest, as at that time these insects are frequently washed from their hiding-places. It also devours seaweeds.

Stone Basse.—This species, which is common in more southern latitudes, and appears to be the *Pagrus totus argenteus* D. Sloane, *Ray Syn. Pisc.* i. 32, approaches the Cornish coasts under peculiar circumstances. When a piece of timber covered with Barnacles is brought by the currents from the regions which these fishes inhabit, considerable numbers of them sometimes accompany it. In the alacrity of their exertions they pass over the wreck in pursuit of each other, and sometimes, for a short space, are left dry on the top, until a succeeding wave bears them off again. From the circumstance of their being usually found near floating wood covered with Barnacles, it might be supposed that this shell-fish forms their food; but this does not appear to be the case, since in many that were opened nothing was found but small fishes. Perhaps these young fishes follow the floating wood for the sake of the insects that accompany it, and thus draw the Stone Basse after them.

* This appears to be a variety of *Labrus Julis*.

GASTEROSTEUS.

Pilotfish. *G. Ductor*.—Two of this species a few years since accompanied a ship from the Mediterranean into Falmouth, and were taken in a net.

SCOMBER.

§ With Finlets distinct.

Mackerel. *S. Scomber*.—This fish is taken on the Cornish coasts for nine months in the year. They have been brought to Plymouth so early as the fifteenth of March; and I have known numbers taken so late as the twentieth of December; those which were caught at this late period appeared to be of the same growth as those which come early in the spring. The females retire long before the males, perhaps to cast their spawn.

§§ With Finlets united.

Scad. *S. Trachurus*.—This species does not visit us so early as the Mackerel, nor do they unite into such considerable bodies; but it is common through the summer.

Albacore. *S. glaucus*.—I believe this fish is not uncommon in the summer; but keeping at a distance from the shore, and seldom taking a bait, it is but rarely taken.

MULLUS.

Striped Surmullet. *M. Surmuletus*.—This is a migratory fish, and usually reaches the Cornish shores about midsummer. Its common habit is to keep close to the ground; but the migration seems to be performed near the surface, since it is not uncommonly taken in nets spread for Mackerel, which are very shallow, at twenty leagues from land, at the season when they are drawing near the shore.

TRIGLA.

TRIGLA.

Piper. *T. Lyra*.—In some seasons this fish is rare, in others they abound.

Elleck. *T. Cuculus*.—This is always common.

Grey Gurnard. *T. Gurnardus*.—Fishes of this genus usually keep near the ground; but this species will mount to the surface over a considerable depth of water, and lie basking in the sun as if dead. At particular periods they abound in an extraordinary degree.

ABDOMINAL FISHES.

SALMO.

Salmon. *S. Salar*.—This fish, and indeed most others that frequent fresh waters, are in greater plenty in the eastern than in the western parts of this county; which seems to arise from the quantity of mineral substances that are thrown into the rivers.

Salmon Trout. *S. Trutta*.—This sometimes takes a bait at sea, which I believe the Salmon and Salmon Peal never do.

Palmer Trout. *S. Salmulus*.—This is not a common fish, but is found in the Trelawny river, a branch of the Looe. It is the Farthing Trout of Carew.

Common Trout or Shote. *S. Fario*.—This fish sports in innumerable varieties, as might be expected, when it is considered that any peculiarity which may arise is liable to be propagated through the river in which it occurs; for they have no opportunity of obliterating it by mixing with the fish of any other river than their own.

Esox.

Garpike. *E. Belone*.—This fish comes in April, and sometimes continues so late as near the end of December; after this it is not seen. It keeps at no great distance from the surface, and swims with great rapidity. When it swallows the hook, and finds itself restrained by the line, it mounts to the surface, and, with the body half out of the water, struggles to set itself free, even before the fisherman perceives that he has hooked a fish. The intestinal canal of this fish runs straight from the gullet to the anus, without any appendix or convolution, or distinction between the stomach and the bowels.

Skipper. *E. Saurus*.—This species does not take a bait. A native of the same climate, this fish nearly resembles the Flying-fish in its manners and its fate. Frequently, when the weather is fair, they are seen to spring from the bosom of the deep, pass over a space of thirty or forty feet, and plunge into the water to rise again in a moment and flit over the same distance. Sometimes this may proceed from wantonness, and sometimes probably from an impulse to escape from the voracious inhabitants of the deep: but it seems surprising that a fish so scantily provided with fins should be able to make such an extraordinary leap; for the pectoral fins, instead of reaching nearly to the tail, as in the Flying-fish, are very small; and though well adapted by their figure to raise and direct the head, cannot afford assistance in supporting the body in the air. The whole motion is effected by the action of the tail and finlets alone, and is more properly a leap than a flight. This is an excellent fish for the table.

Sea Pike. *E. Sphyræna*.—I have been informed that a fish of
this

this genus, which I could refer to no other species but this, was taken some time since near Falmouth; but I have never met with a specimen.

Besides these, I have met with a species which I have never seen described, unless it be the *Esox Brasiliensis* Linn. *Syst. Nat.* It was taken by me in the harbour at Polperro, in July 1818, as it was swimming with agility near the surface of the water. It was about an inch in length, the head somewhat flattened at the top, the upper jaw short and pointed, the inferior much protruded, being at least as long as from the extremity of the upper jaw to the back part of the gill-covers. The mouth opened obliquely downward; but that part of the under jaw which protruded beyond the extremity of the upper, passed straight forward in a right line with the top of the head. The body was compressed, lengthened, and resembled that of the Garpike, *E. Belone*: it had one dorsal and one anal fin placed far behind and opposite to each other; the tail was straight. The colour of the back was a blueish-green, with a few spots; the belly silvery.

MUGIL.

Grey Mullet. *M. Cephalus*.—This fish is known to exercise a considerable degree of cunning when it finds itself in situations of danger; and it is particularly difficult to take it with a net.

CLUPEA.

Herring. *C. Harengus*.—Although the North seems to be the region of Herrings, those which are found on the Cornish coasts do not come from that direction; nor do they at any time go to a great distance, as they are met with throughout the year, except perhaps for a short time in spring. The principal

principal fishery in Cornwall is carried on between October and Christmas.

Pilchard. *C. Pilchardus*.—This fish, so much the object of hope and expectation in Cornwall, does not retire to a great distance at any season, but makes its principal visit towards the end of summer, when it is taken in vast numbers. The fishing begins towards the end of July, and terminates about the time of the autumnal equinox; but in the memory of persons now living, it commenced at the period at which it now ceases, and continued until Christmas. Although Pilchards abound in immense multitudes, and are usually extremely fat, fishermen are unable to determine what it is on which they feed. They have no teeth to hold their prey, and never take a bait; but from frequent examination of the stomach, which is of a fine texture, I am inclined to believe that they principally subsist on the seeds of *Fuci*.

Shad. *C. Aloša*.—This is denominated the Alewife in the West.

Sprat. *C. Sprattus*.—Cornish fishermen do not appear to be aware of any difference between this fish and the young of the Herring and Pilchard. In this respect their sentiments are the same as those in Ray's *Synopsis Piscium* under this fish.

CYPRINUS.

Dace. *C. Leuciscus*.—I have some doubt whether this fish can be considered an original native of Cornwall, as I have not heard of its being found in any other river than that which runs by Launceston, where it may have been placed by some former possessor of Werrington Park, at which place it is chiefly found.

BRANCHI-

BRANCHIOSTEGOUS FISHES.

CYCLOPTERUS.

Lumpfish. *C. Lumpus*.—This fish appears to reside in our seas through the year, but is not often taken. But a small fish of this genus, which I am rather in doubt whether I should consider as the young of this species, or another and distinct, is found plentifully in stony ground in four or five fathoms of water. It is rarely found longer than an inch, and differs from the *C. Lumpus* in the skin between the tubercles being quite smooth. If it be indeed the young of the above species, it seems surprising that when full grown it should not be more frequently taken.

Jura Sucker. *C. Cornubiensis*.—I have seen two varieties of this fish, if they were not distinct species; in one the snout is shaped like a spatula; in the other it was shorter, and ended in a point. The body and head are wide and depressed, with the eyes at the sides, and before each a double fleshy process, about the tenth of an inch long, in a fish that measured two inches; there is a fleshy tubercle close behind these processes. The lips membranous; the lower jaw a little the shortest, opening with a very wide gape. Behind the head are two dark spots, each with a blueish speck in the middle. The body tapers to the tail; the dorsal and anal fins begin at a third of the whole length from the tail, and run back to that part; the pectorals are far behind; the tail round. The sucking apparatus is formed of two circles, one before the other, furnished with numerous very small tubercles. The colour is dusky, sometimes crimson; the belly flesh-coloured. When the colours faded after death, I observed many spots on the sides, which were

were not visible before. It adheres with some degree of force. When the tide retires, this fish sometimes takes refuge under a stone.

Another species, which I do not recollect to have seen noticed, is not uncommon about low-water mark, where it hides under stones. The head is broad and flat, sloping from behind the eyes to the mouth. The body tapers from the pectoral fins to the tail; it is smooth, a dusky-yellow on the back and sides, the belly white; it has a row of white points along the lateral line, and also about the head and mouth, which secrete mucus. Thirteen tubercles form the sucking apparatus; but I could never get this fish to adhere to any substance. The tail is round; the dorsal and anal fins long, the former beginning just above the pectoral fins, the latter at the abdominal tubercles, and both run to the tail; which part, with the dorsal and anal fins, is crossed by dark bars. When this fish rests, it has a singular custom of throwing its tail forwards toward the head. It rarely exceeds an inch in length*.

TETRAODON.

Oblong Sunfish. *T. truncatus*.—Naturalists have been divided in their endeavours to account for the name of the Sunfish; but the appearance of the common Sunfish when in the water or newly taken, is sufficient to account for it. At this time the surface of the body has a bright and glittering appearance, as if coated with tin-foil; but in a short time after death this passes off.

* This is probably a variety of *C. liparis*.

CENTRISCUS.

CENTRISCUS.

Trumpetfish. *C. Scolopax*.—A fish of this species was thrown on shore in St. Austel Bay, and came into the possession of William Rashleigh, Esq. of Menabilly, a gentleman distinguished for his love of natural history, who possesses a fine drawing of it. It was five inches long, and from the back to the belly one inch and two-eighths; in thickness three-eighths of an inch; it weighed three drams. The proboscis, which to the eye measured an inch and five-eighths, was formed of a bony substance, which was continued along the back, where it terminated in a sharp point, and spreading in the middle, where it makes an obtuse angle just above a small fin behind the gills.

CHONDROPTERYGIOUS FISHES.

RAIA.

Torpedo or Cramp Ray. *R. Torpedo*.—This fish is extremely rare. The numbing power of the Torpedo has been much illustrated by the discoveries which have been made in galvanism; but the cause of this phænomenon appears to me not to have been explained. I would therefore suggest the following observations on this subject. It has been supposed, that by this faculty the Torpedo is enabled the more readily to secure its prey; and when Pennant took a Surmullet from the stomach of a Torpedo, he concluded that it must have been first disabled by the shock before it could have been swallowed by its enemy. But I have known a Lobster, whose agility is much superior to that of a Surmullet, taken from the stomach of a Skate; which fish possesses no such formidable means of disabling its prey. Without denying that the Torpedo may devour that which

it disables by the shock, I conceive that the principal use of this power has a reference to the functions of digestion. It is well known that an effect of lightning, or the electric shock, is to deprive animated bodies very suddenly of their irritability; and that thereby they are rendered more readily disposed to pass into a state of dissolution than they would otherwise be; in which condition the digestive powers of the stomach can be much more speedily and effectually exerted on them. If any creature may seem to require such a preparation of its food more than another, it is the Torpedo, the whole intestinal canal of which is not more than half as long as the stomach.

SQUALUS.

Monkfish. *Sq. Squatina*.—Common; keeps near the bottom, and is most commonly taken in nets. The propriety of ranking this fish with the *Squali* seems to me to be doubtful: the terminal mouth and depressed body afford sufficient distinctions for a new genus, which might be denominated *Squatina*, and in which the following species might find a place.

Lewis.—This fish, so named by fishermen, by whom it is not unfrequently taken with a line, bears some resemblance to the Monk, but is somewhat smaller; and as I have not been able to assign it a Linnæan name, I subjoin a description: The head is large, flat, the jaws of equal length, forming a wide mouth; the upper jaw falls in somewhat at the middle, so that at this part the lower jaw seems a little the longest; both are armed with several rows of sharp teeth; the tongue is small. The head is joined to the body by something which resembles a neck; the body is flat so far back as the ventral fins, beyond these it is round; the pectoral

pectoral and ventral fins are very large; the former are flat, and both have near their extremities a number of spines. The two dorsal fins are placed far behind; the lobes of the tail are equal and lunated. There are five spiracula; the eyes are very small, and the nictitating membrane, which is of the colour of the common skin, contracts over the eye, leaving a linear pupil. The body is slightly rough, of a sandy-brown colour; the under-parts white. It is about five feet long, and keeps near the bottom.

Tope. *Sq. galeus*.—I think this is the species which is by the fishermen denominated the White Hound; if so, it is very prolific, as thirty young ones have been taken from the belly of a single female.

Smooth Hound. *Sq. Mustelus*.—This keeps near the bottom, and feeds chiefly on crustaceous animals, which its blunt teeth are well calculated to crush.

Basking Shark. *Sq. maximus*.—A fish of this species, taken at Penryn in 1809, measured thirty-one feet in length, eight feet and a half high, and nineteen feet round; the mouth was five feet and a half wide; the extent of the tail six feet nine inches; the weight eight tons.

Porbeagle. *Sq. cornubicus*.—This fish rarely takes a bait; yet it is not uncommon, and hunts its prey in companies; from which circumstance it has received its common name.

There are in the possession of William Rashleigh, Esq. of Menabilly, a drawing and memorandum of a fish of this genus, which I am not able to refer to any known species; it was twenty-nine feet four inches long, twenty-four feet round, the fork of the tail seven feet, and the weight four tons; in the drawing, the eye is in front, under a snout that projects and is turned upward; the mouth is two feet and a half wide. The head is deep; the first dorsal fin

much elevated. This fish seems to resemble the Basking Shark, but differs from it in the form of the head and situation of the eye.

ACCIPENSER.

Common Sturgeon. *A. Sturio*.—Of an individual taken in a trammel-net near this place, the fishermen observed that it threw up several large bubbles of air as they raised it from the bottom; this I have no doubt came from the swimming-bladder; for on examination I found it empty; and the discharge appears to have been intended to prevent its ascent; it made no other effort to escape.

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